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09/965,810	10/01/2001	Alan F. Graves	86114-15	3412

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EXAMINER	
WANG, QUAN ZHEN	
ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 09/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/965,810	GRAVES, ALAN F.	
	Examiner	Art Unit	
	Quan-Zhen Wang	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/01/2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/01/2001*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-7, 12-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Cai et al. (U. S. Patent 6,330,383 B1).

Regarding claims 1 and 12. Cai et al. disclose in fig. 10B a dispersion discrimination and compensation system, comprising an anti-dispersive element (tunable dispersion compensation 1020a) having an input for receiving a first signal (1012) and an output for providing a second optical signal (1032), a dispersion discriminator (dispersion analyzer 1030) connected to the anti-dispersive element and adapted to determine a dispersion characteristic of the second optical signal, and a processor (grating control 1040) connected to the dispersion discriminator and to the anti-dispersive element, the processor being adapted to generate the first control signal (the arrow between 1040 and 1020a) as a function of the second control signal (the arrow between 1030 and 1040) to exert feedback control of the dispersion compensation applied to the first optical signal by the anti-dispersive element (column 8, lines 62-67; column 9, lines 1-19).

Regarding claim 2, Cai et al. disclose in fig. 10B an optical splitter (the 45 degree short line intercross 1032) connected to the dispersion discriminator and to the output of the ant-dispersive element.

Regarding claims 3, 4, 5, 6, 13, 14, 15, and 16, Cai et al. disclose the dispersion analyzer measures the amount (magnitude) and the sign (polarity) of the accumulated dispersion (column 9, lines 1-2) and the dispersion includes both chromatic dispersion (column 15, lines 40-45) and polarization mode dispersion (column 16, lines 56-59).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cai et al. (U. S. Patent 6,330,383 B1) in view of Sugihara et al. (U. S. Patent Application Publication US 2001/0008452 A1).

Regarding claim 7, Cai et al. disclose a dispersion compensation system to compensate dispersion for either a single channel or for WDM fiber communication system (Column 1, lines 43-44). Cai et al. differ from the claimed invention in that Cai et al. do not teach to use a front-end selector (FES) to select a single channel out from a multi-channel WDM signal to provide dispersion compensation for the selected channel. However, Sugihara et al. disclose in fig. 1 a PMD compensation system comprising a

wavelength variable filter 17, a sweep control 18, a polarization analyzer 19, compensation control 16 and PMD compensation 13. The combination of the disclosed wavelength variable filter and the sweep control reads on the claimed FES. Therefore, it would have been obvious for one having ordinary skill in the art at the time when the invention was made to employ the wavelength selection (FES) taught by Sugihara et al. to the dispersion compensation system taught by Cai et al. to provide desired dispersion compensation to a particularly selected channel.

Regarding claim 8, Cai et al. differ from the claimed invention in that Cai et al. do not teach to use a plurality of anti-dispersive elements providing dispersion compensations for a plurality of multi-channel signals, a front-end selector (FES) to select a single channel out from a multi-channel WDM signal to provide dispersion compensation for the selected channel. However, Sugihara et al. disclose in fig. 3 a PMD compensation system comprising an optical switch 33, a sweep control 34, a polarization analyzer 19, compensation control 16 and PMD compensation 30. Sugihara et al. further disclose in fig. 7 a plurality of PMD compensation 13-1 to 13-k. The combination of the disclosed optical switch and the sweep control reads on the claimed FES; and the disclosed polarization analyzing section 19 plays a part of the role as the claimed processor. Therefore, it would have been obvious for one having ordinary skill in the art at the time when the invention was made to adapt the dispersion compensation scheme disclosed by Sugihara et al. to the dispersion compensation system taught by Cai et al. to provide desired dispersion compensation to a particularly selected channel.

Regarding claim 9, Sugihara et al. disclose the processor (polarization analyzing section 19) controls the FES (fig. 3, the arrow from element 19 to element 34).

Regarding claim 10, Sugihara et al. disclose the polarization analyzing section 19 (claimed processor) is adapted to receive information signals from the FES (fig. 3, the arrow from element 33 to element 19).

Regarding claim 11, Sugihara disclose in fig. 3 a plurality of optical taps (optical splitters) 31a and 31b connecting the FES and the output optical signals.

4. Claims 17-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cai et al. (U. S. Patent 6,330,383 B1) in view of Sugihara et al. (U. S. Patent Application Publication US 2001/0008452 A1) as applied to claims 7-11 above, and further in view of Gloeckner et al. (U. S. Patent 6,445,841 B1).

Regarding claims 17, Cai et al. in view of Sugihara et al. differ from the claimed invention in that Cai et al. in view of Sugihara et al. do not specifically teach to apply the disclosed dispersion compensation method to an optical switch as claimed. However, Gloeckner at al. disclose in fig. 10A an optical switch having a plurality of optical ports for accepting a first plurality of optical signals (Input Fibers); a plurality of optical output ports for providing a second plurality of optical signals (Output Fibers); and with input/output power monitoring capabilities (1010 and 1020). Therefore, it would have been obvious for one having ordinary skill in the art at the time when the invention was made to apply the dispersion compensation methods disclosed by Cai et al. in view of

Sugihara et al. to the optical paths of the optical switch disclosed by Gloeckner at al. to provide variable dispersion compensation to the first plurality of optical signals.

Regarding claim 18, both Cai et al. and Sugihara et al. teach that the optical signals are composed of multi-channel optical signals (Cai et al. Fig. 19A; Sugihara et al., figs. 2 and 3).

Regarding claims 19 and 20, neither Cai et al. in view of Sugihara et al. nor Gloeckner et al. teach to place anti-dispersive elements between the input ports and the switch matrix, or between the switch matrix and the output ports. However, the examiner takes Official Notice that it would have been obvious for one having ordinary skill in the art at the time when the invention was made to place anti-dispersive elements either between the input ports and the switch matrix, or between the switch matrix and the output ports in order to provide dispersion compensation to the first plurality of optical signals.

Regarding claims 21-22, Cai et al. in view of Sugihara et al. differ from the claimed invention in that Cai et al. in view of Sugihara et al. do not teach to connect a switch controller to the processor. However, Gloeckner et al. disclose a switch controller (fig. 18, Configuration control 1774) for the switch matrix. Therefore, it would have been obvious for one having ordinary skill in the art at the time when the invention was made to connect the switch controller to the processor by a communication link in order for the processor to provide the information of dispersion compensation to the switch controller.

Regarding claim 23, Sugihara et al. disclose the processor (polarization analyzing section 19) controls the FES (fig. 3, the arrow from element 19 to element 34) to select a single channel.

Regarding claim 24, Cai et al. in view of Sugihara et al. differ from the claimed invention in that Cai et al. in view of Sugihara et al. do not teach to connect a verification optical link of an optical switch to the processor. However, Gloeckner et al. disclose a path integrity verification subsystem comprising a first verification optical link (fig. 10A, the link to 1020) and a second verification optical link (fig. 10A, the link to 1010) monitoring the switching function (input and output power) of the switch. Therefore, it would have been obvious for one having ordinary skill in the art at the time when the invention was made to connect the verification optical link of the switch to the processor to provide the information of a possible failure of the switch.

Regarding claim 25, 27, and 30, Gloeckner et al. further disclose a switch matrix comprises a plurality of per-wavelength switching planes (fig. 19, 1786); a plurality of wavelength division demultiplexer (fig. 19, 1731a,b), each one connected to one of optical input ports; a plurality of wavelength division multiplexer (fig. 19, 1731c,d), each one connected to one of optical output ports. Therefore, it would have been obvious for one having ordinary skill in the art at the time when the invention was made to apply the dispersion compensation methods disclosed by Cai et al. in view of Sugihara et al. in the claims above to the optical paths of the optical switch disclosed by Gloeckner at al. to provide variable dispersion compensation on per channel basis.

Regarding claims 28 and 29, Cai et al. in view of Sugihara et al. differ from the claimed invention in that Cai et al. in view of Sugihara et al. do not teach to connect a switch controller to the processor. However, Gloeckner et al. disclose a switch controller (fig. 18, Configuration control 1774) for the switch matrix. Therefore, it would have been obvious for one having ordinary skill in the art at the time when the invention was made to connect the switch controller to the processor by a communication link in order for the processor to provide the information of dispersion compensation to the switch controller.

Regarding claims 31 and 32, Gloeckner et al. further disclose a plurality of banded wavelength division demultiplexer (fig. 19, 1731a,b), each one connected to one of optical input ports; a plurality of wavelength division multiplexer (fig. 19, 1731c,d), each one connected to one of optical output ports. Therefore, it would have been obvious for one having ordinary skill in the art at the time when the invention was made to apply the dispersion compensation methods disclosed by Cai et al. in view of Sugihara et al. to the optical paths of the optical switch disclosed by Gloeckner at al. to provide variable dispersion compensation on per channel basis.

5. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cai et al. (U. S. Patent 6,330,383 B1) in view of Sugihara et al. (U. S. Patent Application Publication US 2001/0008452 A1) and further in view of Gloeckner et al. (U. S. Patent 6,445,841 B1) and further in view of Novotny (U. S. Patent 6,625,341 B1).

Regard claim 26, Cai et al. in view of Sugihara et al. and further in view of Gloeckner et al. differ from the claimed invention in that Cai et al., Sugihara et al. and Gloeckner et al. do not teach to use variable optical intensity controllers (VOICs) to provide equalization of optical power of plurality of data channels in their systems. However, Novotny teaches to use variable optical intensity controllers (variable optical attenuator, column 6, lines 52-54) in his optical switch to result an optical switch with equalization (column 6, lines 54). Therefore, it would have been obvious for one having ordinary skill in the art at the time when the invention was made to apply the variable optical intensity controllers (VOICs) taught by Novotny to the dispersion compensated optical switching systems disclosed by Cai et al. in view of Sugihara et al. and further in view of Gloeckner et al. to equalize optical power of the plurality of data channels.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ishikawa et al. (U.S. Patent 6,501,580, B1) disclose a methods and apparatus for optimizing dispersion in an optical fiber transmission line.

Eggleton et al. (U.S. Patent 6,370,300 B1) disclose an automatic dispersion compensation method.

Fee (U. S. Patent 6,515,779 B2) disclose method and system for compensating chromatic dispersion in an optical networks.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan-Zhen Wang whose telephone number is (571) 272-3114. The examiner can normally be reached on 8:30 AM - 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

m. R. Sedighian

qzw

M. R. SEDIGHIAN
PRIMARY EXAMINER